derma Stem Cell vs Immune Suppression Trial), comparing HSCT to IV pulse CY is now enrolling patients.

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LONG TERM REMISSION IN SEVERE AND REFRACTORY LUPUS (SLE) AFTER AUTOLOGOUS STEM CELL TRANSPLANTATION

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The concept of autologous stem cell transplantation (ASCT) is a resetting of the immune system. High dose chemotherapy and immune ablation destroys the immune system (autoreactivity) of the patient followed by a T cell depleted stem cell transplant with development of a tolerant immune system. Seven patients (age 19–48 years) with life threatening SLE characterized by severe organ involvement with persistent active disease despite treatment with standard immunosuppressive drugs were treated in the Berlin phase I/II trial since 1998 with a median follow up of 55 (8–90) months. Treatment includes mobilization of hematopoietic stem cells with cyclophosphamide (CY) 2 g/m^2 and G-CSF (10 ug/kg/day), leukapheresis and enrichment of CD34+ cells, conditioning with CY 200 mg/kg and rabbit antithymocyte globuline (ATG) 90 mg/kg followed by ASCT. Clinical and serological remission could be achieved in 7/7 patients. One of 7 patients died due to cerebral aspergillosis on d + 90, 1 patient had a flare at 17 months and died due to uncontrolled SLE 36 months post ASCT. At the time of flare change of autoantibody profile occurred and naive Th-cells and naive B-cells declined compared to the remission patients. Five patients are alive in clinical remission. These patients are autoantibody negative and no autoreactive Th-cells directed to nucleosome could be detected after ASCT. One of these patients gave birth to a healthy boy 35 months post ASCT. Open questions in ASCT for treatment of SLE are: Is TRM associated with stage of disease at ASCT/intensive pretreatment? Why do some patients relapse? Methods of prevention of relapse after ASCT? In Germany, a multicenter clinical trial protocol is initiated to answer these questions.

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VIRAL INFECTIONS DURING CD34+ CELLS PURIFIED AUTOLOGOUS PERIPHERAL BLOOD STEM CELL TRANSPLANTATION FOR THE TREATMENT OF REFRACTORY AUTOIMMUNE DISEASES

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Aims: We retrospectively analyzed viral infections during CD34+ cells autologous peripheral blood stem cell transplantation (PBSCT) for the treatment of refractory autoimmune diseases (AD). **Materials and Methods:** 9 cases of systemic sclerosis (SSc) with interstitial pneumonia(IP),1 case of amyopathic dermatomyositis (ADM) with IP, 1 case of Wegener granulomatosis (WG) with exophthalmous. Except one SSc patient No. 9, all patients had been treated with steroid, and were administered with steroid during peri-transplant period. PBSC were mobilized with cyclophosphamide (CY) 4 g/m^2+G-CSF, and CD34+ cells were purified with CliniMACS. Pre-transplant conditioning consisted of CY 200 mg/kg. Acyclovir (ACV) 250 mg/day was administered from day1 to day 35. **Result:** Before PBSC mobilizations, patient No. 2 with ADM was positive for cytomegalovirus (CMV) antigenemia and treated with gancyclovir (GCV). After PBSC mobilizations, 3 patients became positive for CMV antigenemia (3/11 27%) treated with GCV, and 1 patient developed genital herpes simplex virus infection treated with ACV. After transplantations, 5 out of 11 patients (45%) became positive for CMV antigenemia treated with GCV. Median day becoming positive for CMV antigenemia was 22.5 days post-transplant ranging 10 to 38 days. Two patients, No.1 and No. 8 (18%), developed adenoviral hemorrhagic cystitis (adeno HC) on day 64 and day 33, respectively, treated with cidofovir (CDV). **Discussion:** Before transplantations, most of AD patients had received immunosuppressive therapy. CD34+ cells PBSCT is an immunosuppressive therapy. Thus, during peri-transplant period, AD patients developed various viral infections. Infection surveillance and diagnostic work-up, same as with those used in allogeneic recipients seem to be necessary (Table1).

Patient No.	Age/ Sex	Diseases	Pre-mobilization Steroid Tx	Pre-mobilization Viral Infections	Post-mobilization Viral Infections	Post-transplant Viral Infection
1	54/F	SSc/IP	yes			day 38 CMV, day 64 adeno HC
2	54/F	ADM/IP	yes	CMV	CMV	day 21 CMV
3	55/M	SSC/IP	yes		CMV	
4	58/M	SSc/Ip	yes			day 10 CMV
5	54/F	SSc/IP	yes			day 24 CMV
6	53/F	SSC/IP	yes			
7	21/M	WG	yes			
8	49/F	SSc/IP	yes		CMV	day 31 adeno HC, day 33 CMV
9	33/F	SSc/IP	no			
10	63/F	SSc/IP	yes		genital HSV	
11	61/F	SSc/IP	yes		CMV	day 21 CMV

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TARGETED TOTAL MARROW IRRADIATION USING 3D IMAGE GUIDED TOMOGRAPHIC INTENSITY MODULATED RADIATION THERAPY: AN ALTERNATIVE TO STANDARD TBI

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Purpose: TBI is an important part of many hematopoietic stem cell transplant (HSCT) conditioning regimens. Dose escalation of TBI has been difficult due to associated organ toxicities. A method to deliver a more targeted dose of TBI to sites of greatest tumor burden is needed to reduce dose to normal organs, reduce toxicities, and permit dose escalation. The purpose of this study was to evaluate the delivery of targeted myeloablative doses of radiation to bone and marrow using a recently developed image guided tomographic intensity modulated radiation therapy delivery system (tomotherapy). **Methods:** CT data sets from 3 patients (2 AML and 1 multiple myeloma) were used for dosimetry planning studies to evaluate two strategies: total marrow irradiation (TMI), where the target region was defined as the skeletal bone, and total marrow and lymphoid irradiation (TMLI), where the target regions were defined as bone, major lymph node chains, liver, spleen, and sanctuary sites, such as brain. Organ doses and dose distributions were compared to conventional TBI. **Results:** A 1.7 to 7.5-fold reduction in median organ dose was observed with TMI and TMLI compared to conventional TBI. Dose-volume histogram analysis predicted for the potential to escalate dose to bone and marrow up to 20 Gy with TMI, while maintaining doses to normal organs at lower levels compared to conventional TBI to 12 Gy (Table). Results were similar for the adult and pediatric patients indicating that this method will be applicable to most patients regardless of frame size. TMI to 10 Gy was delivered as part of an autologous tandem transplant regimen to the patient with multiple myeloma. Clinical results confirmed treatment planning predictions. After TMI, the patient experienced the expected blood count nadir,